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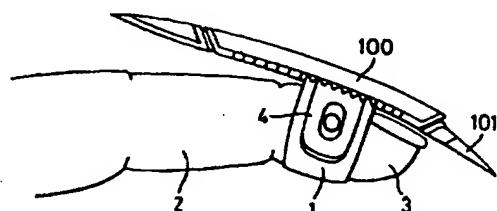
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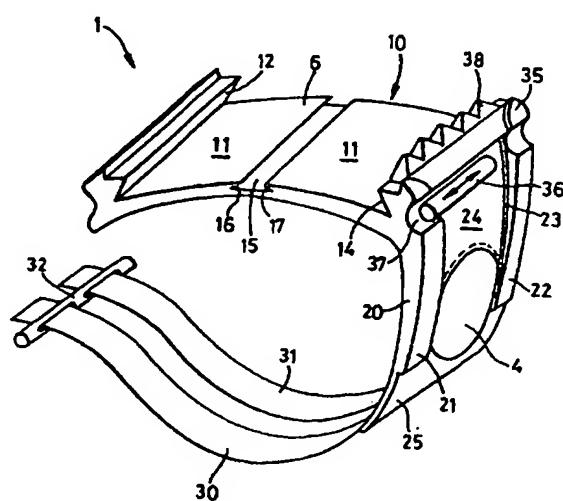
**(54) Abstract Title**

#### **Finger tool with adjustable strap**

(57) The tool includes an adjustable strap comprising a pair of resilient members 30,31 connected to a bar 32 which is releasably-engagable with a hook (33, Fig 2) on a tool carrier plate 6. A tool is slidably-receivable on the plate by means of channels defined by re-entrant sides 12,14 and 16,17. The tool can be locked in position on the plate by teeth 38 actuated by a sliding release mechanism 4 and locking pin 36. In an alternative embodiment the strap may be an elasticated web 3a, Fig 7(c). The tool may comprise a writing instrument, cosmetic applicator or a hairdressing tool.



*Fig. 1(d)*

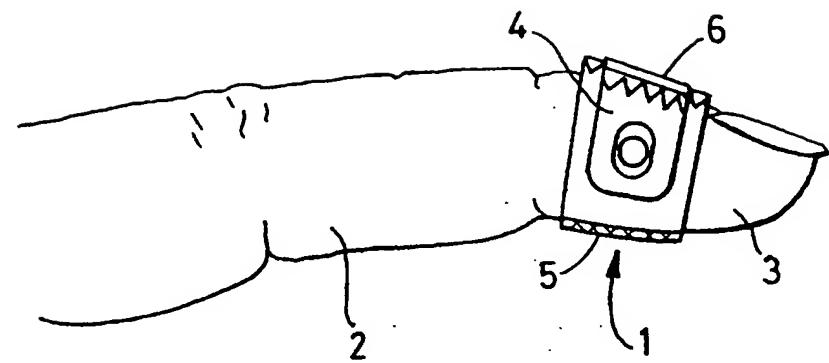


*Fig. 3*

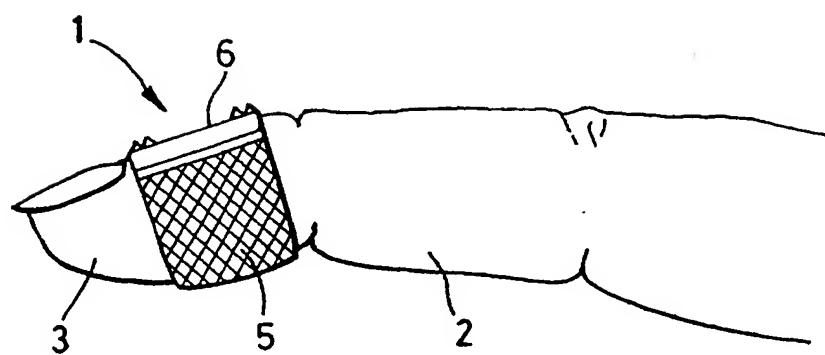
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**At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.**

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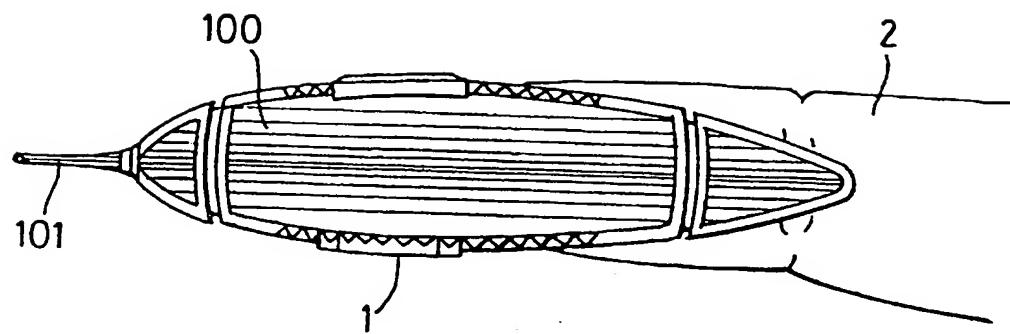


*Fig. 1(a)*

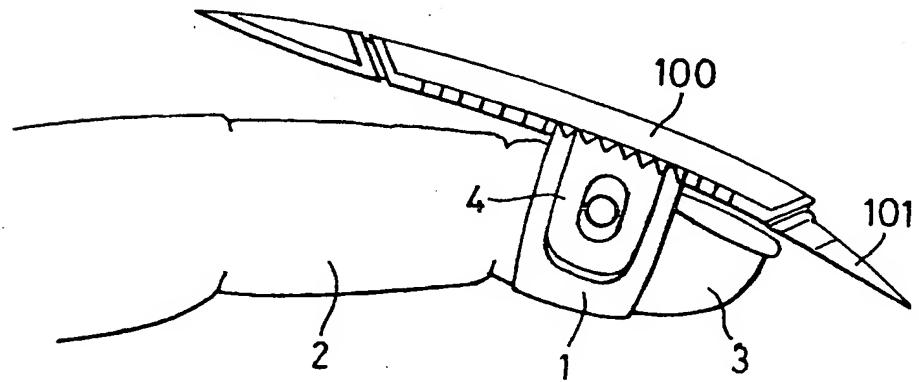


*Fig. 1(b)*

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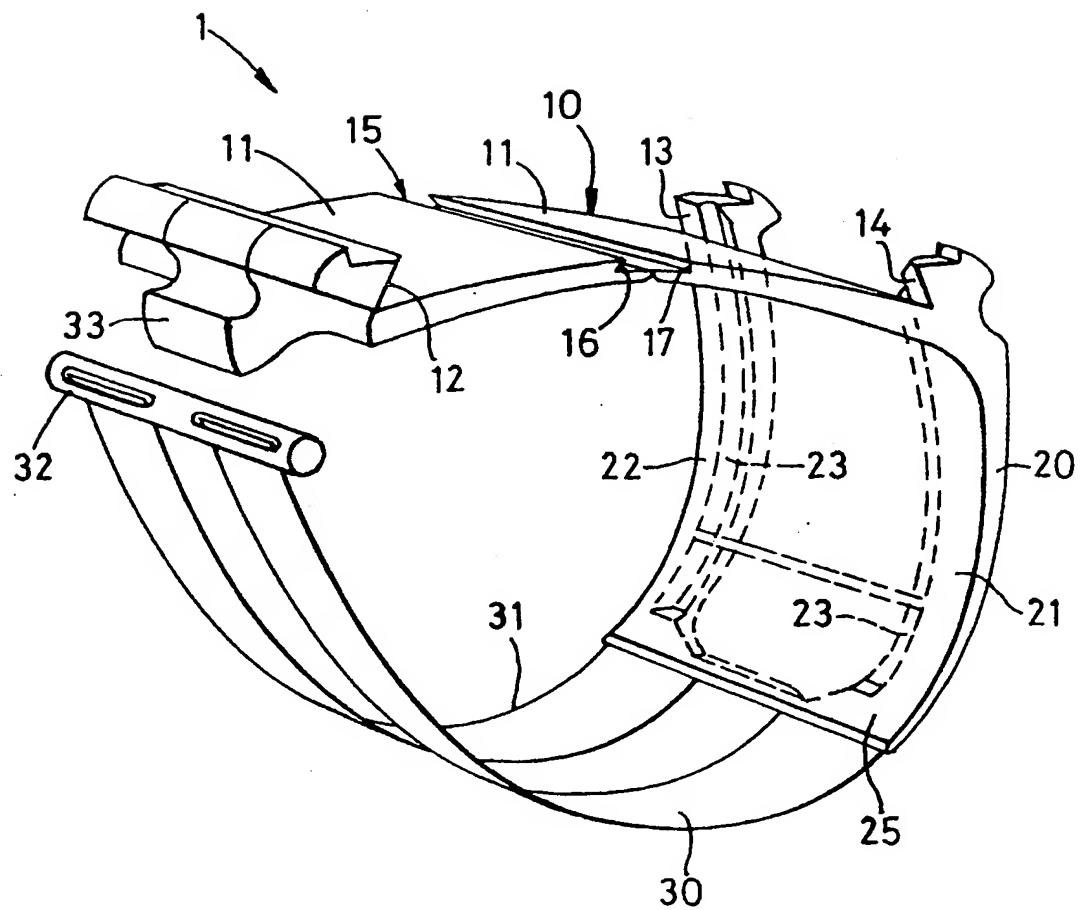


*Fig. 1(c)*

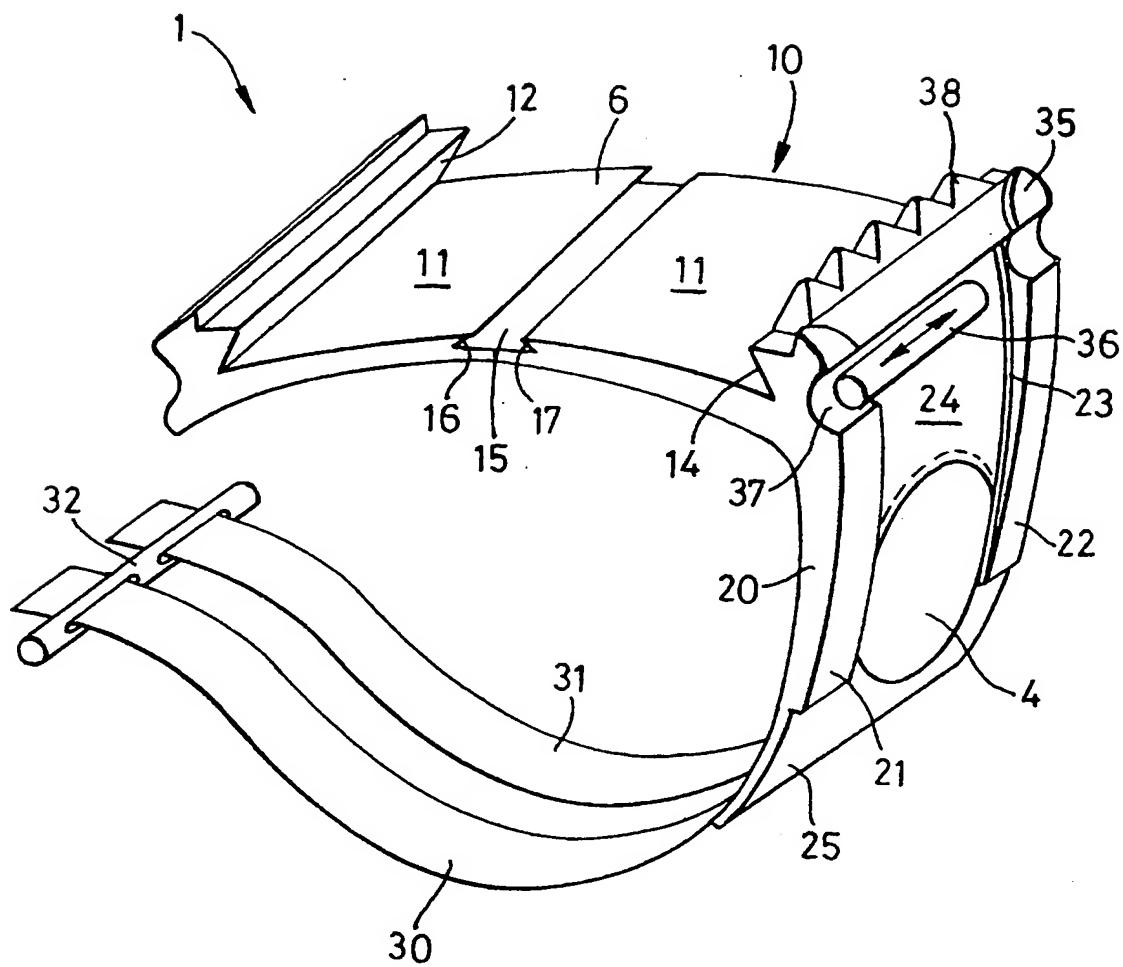


*Fig. 1(d)*

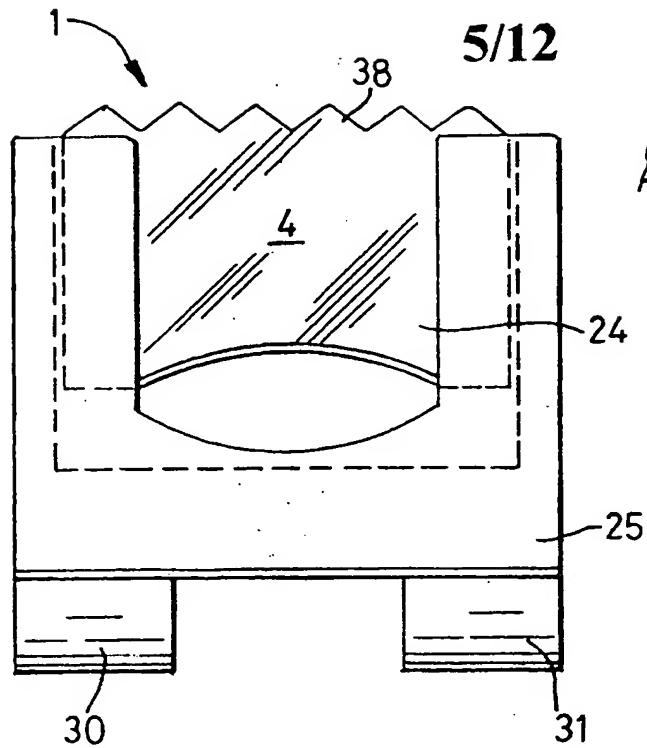
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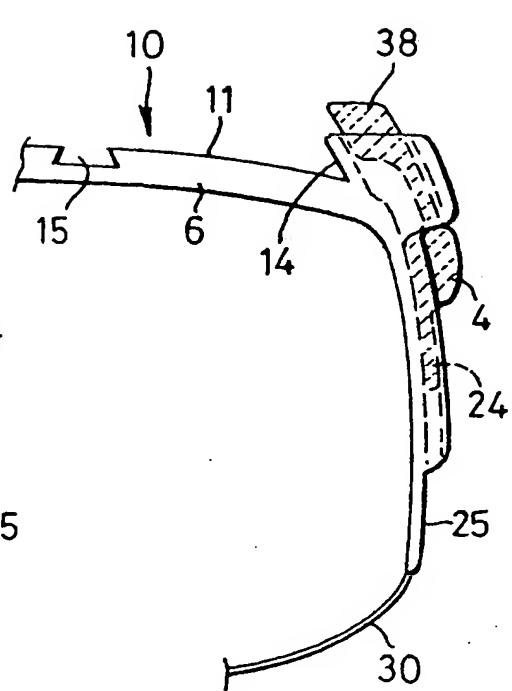
*Fig. 2*



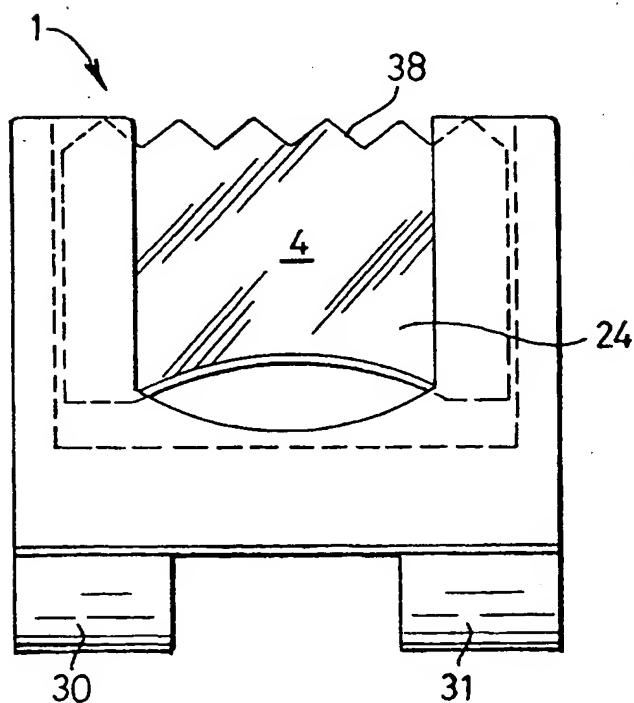
*Fig. 3*



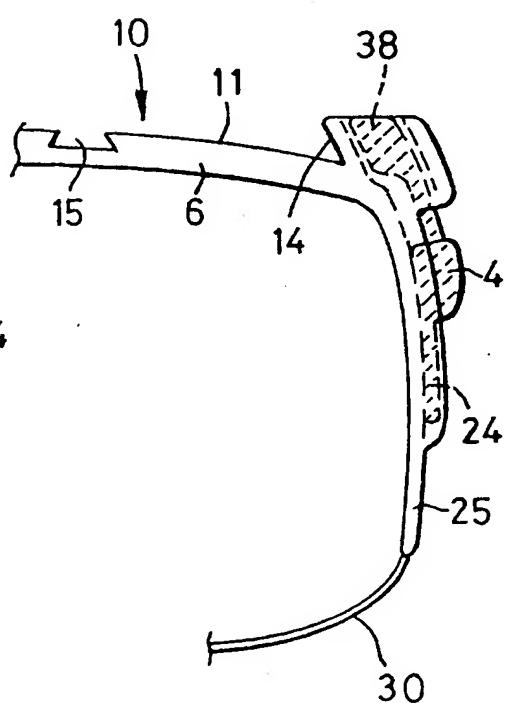
**Fig. 4(a)**



**Fig. 4(b)**

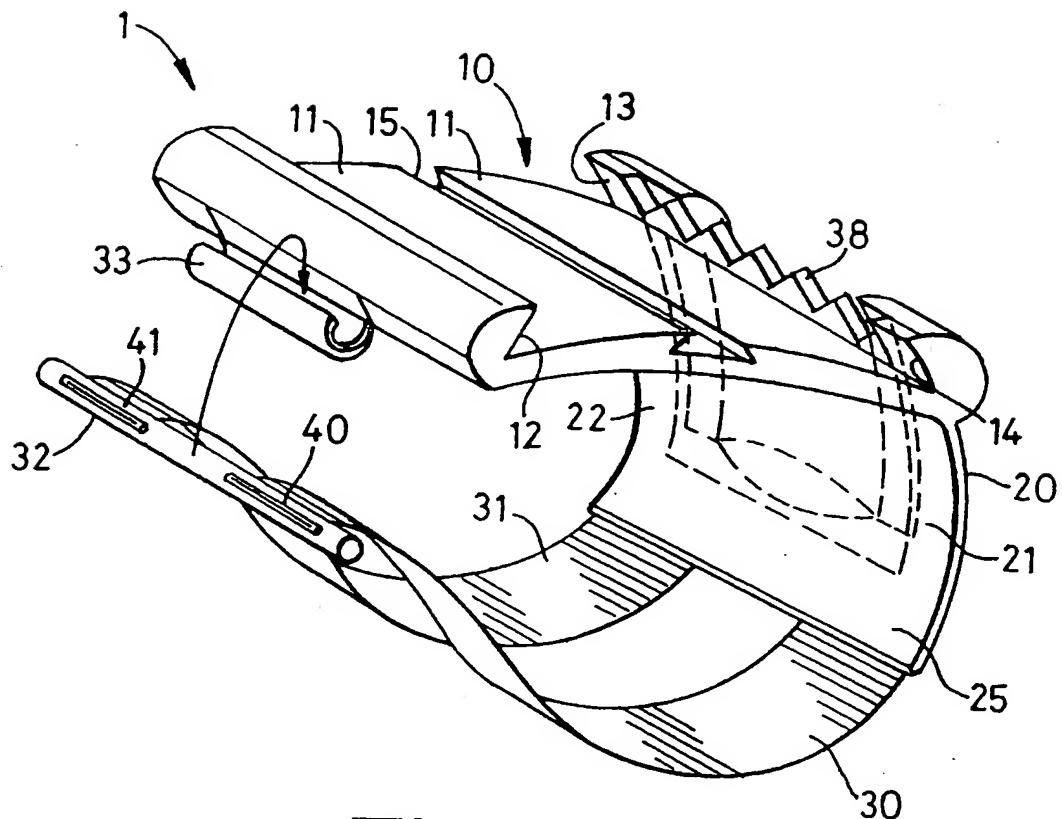


**Fig. 5(a)**

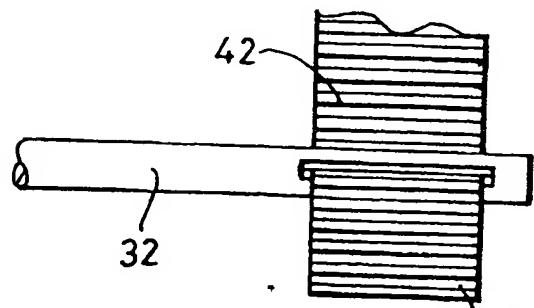


**Fig. 5(b)**

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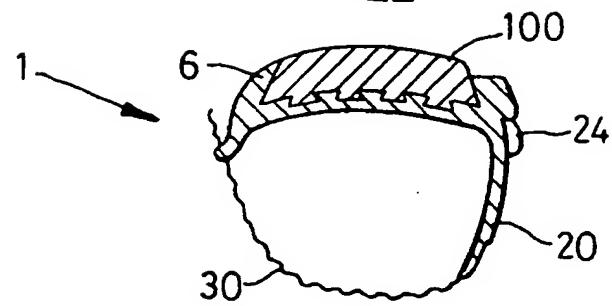


*Fig. 6(a)*

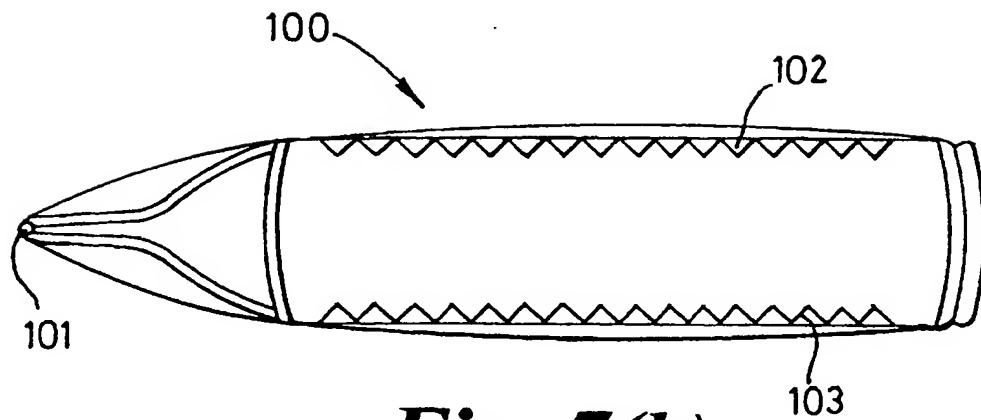


*Fig. 6(b)*

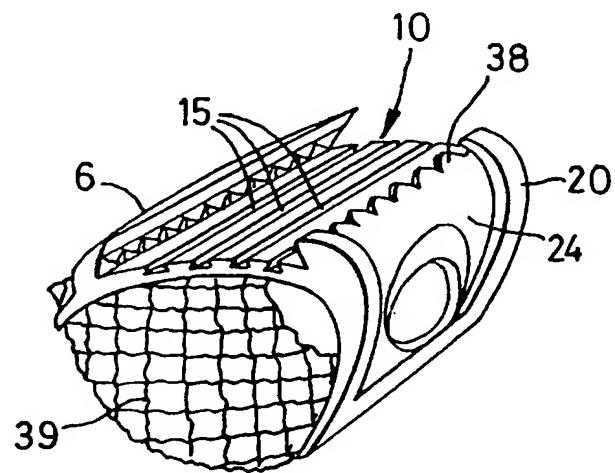
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***Fig. 7(a)***

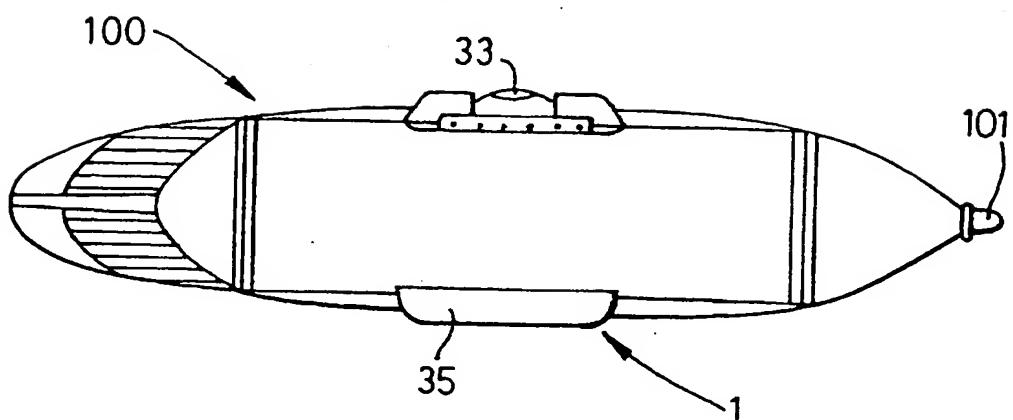


***Fig. 7(b)***

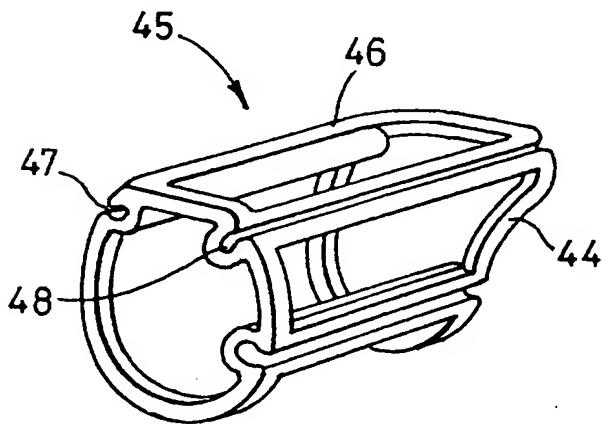


***Fig. 7(c)***

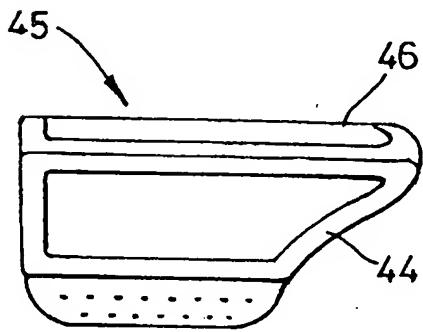
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*Fig. 8*

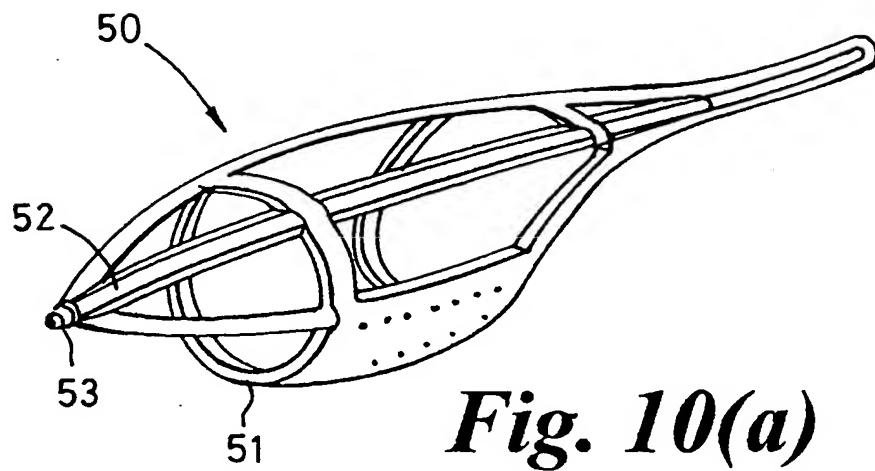


*Fig. 9(a)*

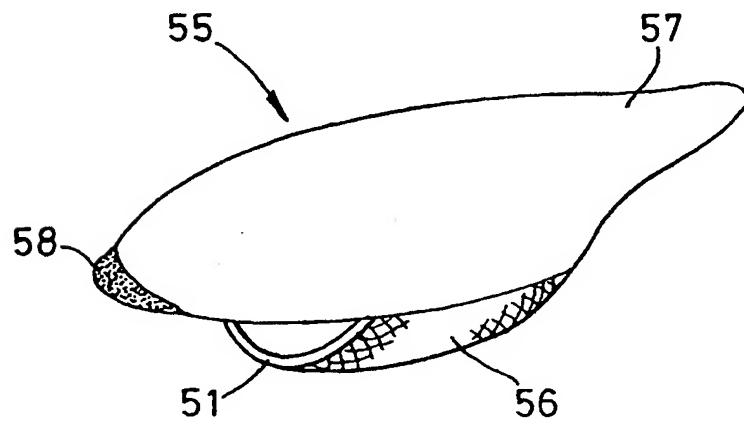


*Fig. 9(b)*

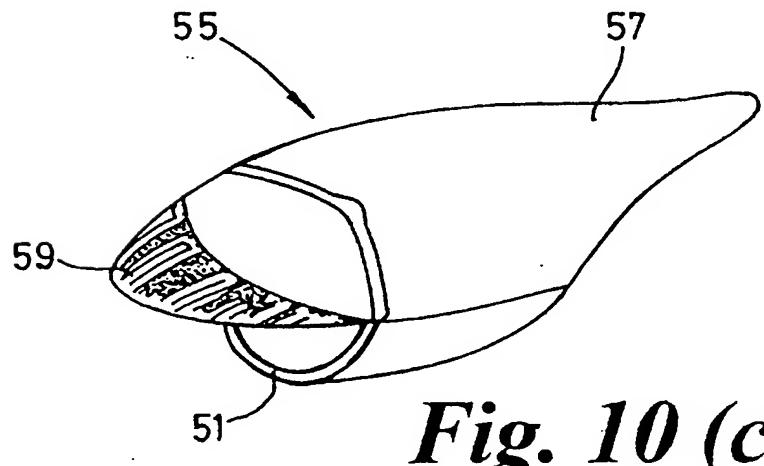
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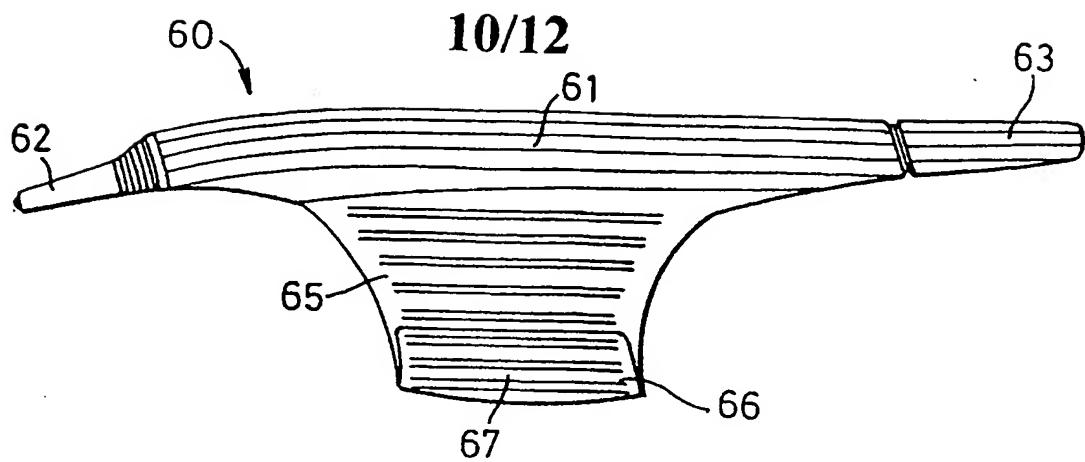
**Fig. 10(a)**



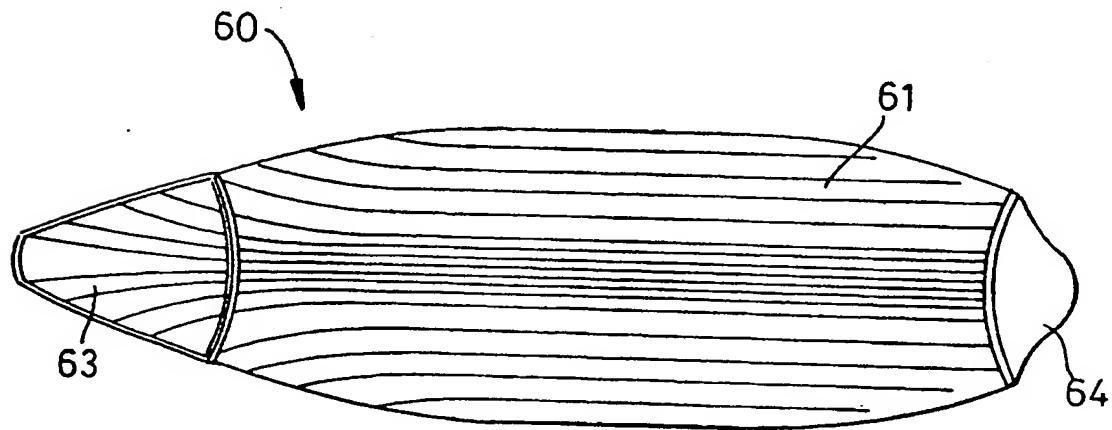
**Fig. 10(b)**



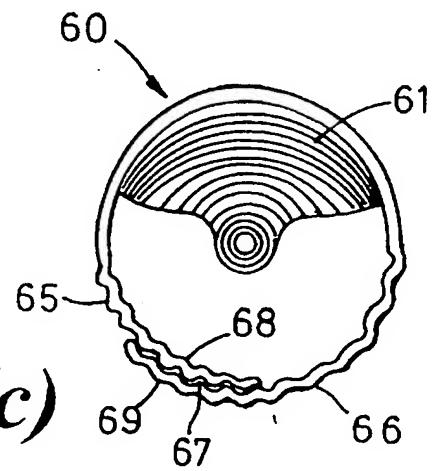
**Fig. 10 (c)**



*Fig. 11(a)*



*Fig. 11(b)*



*Fig. 11(c)*

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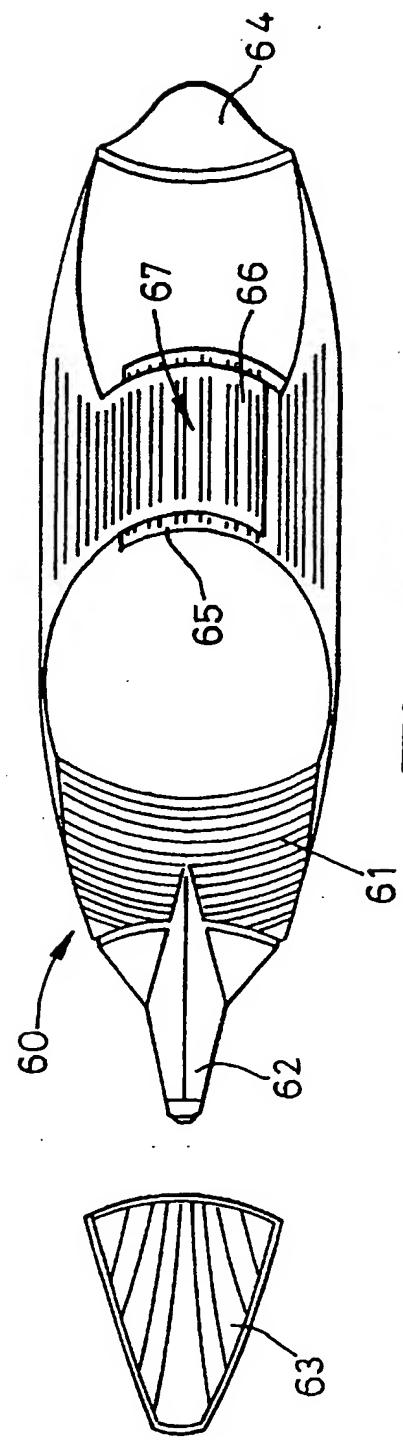


Fig. 11(a)

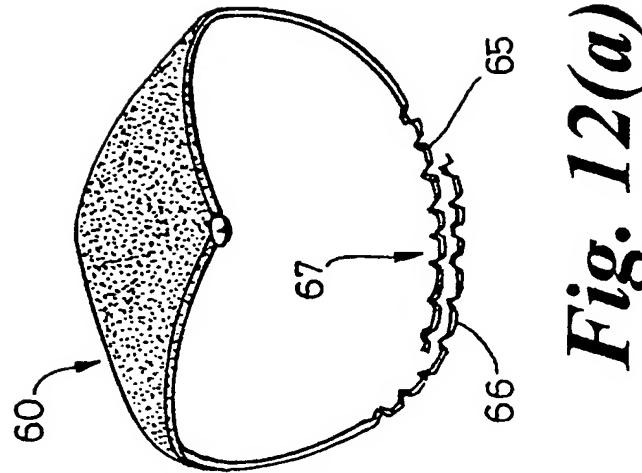


Fig. 12(a)

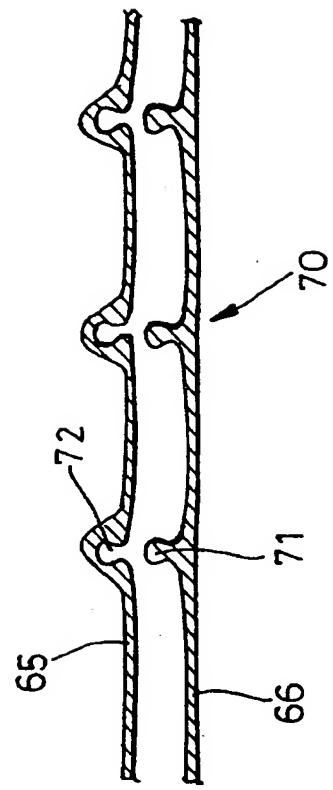
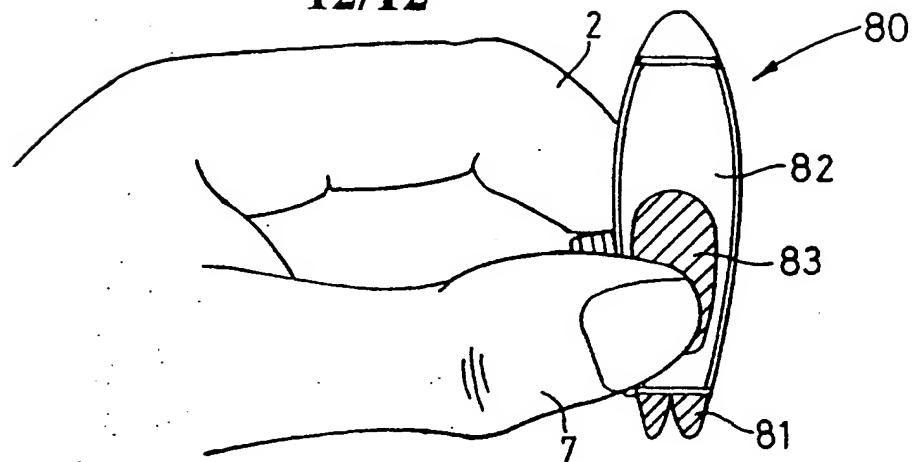
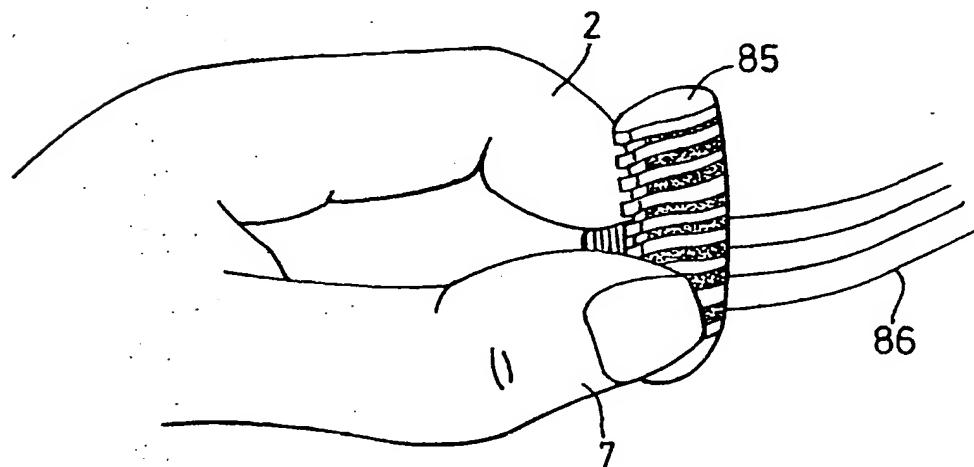


Fig. 12(b)

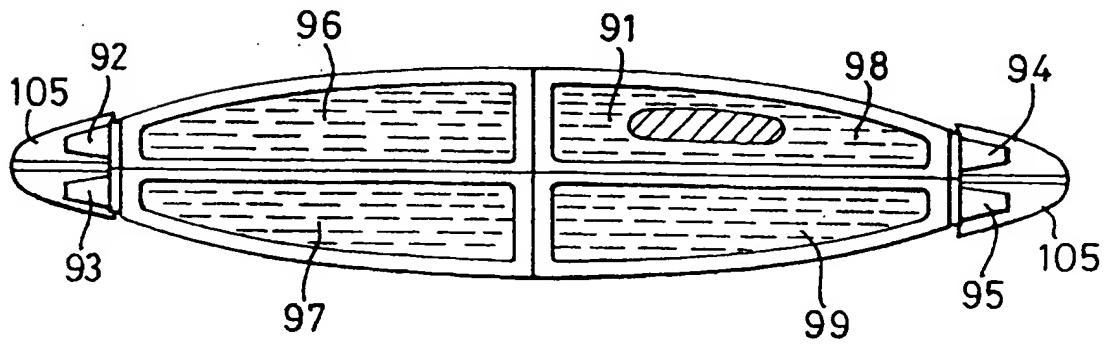
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***Fig. 13***



***Fig. 14***



***Fig. 15***

FINGER TOOLS

The present invention relates to hand tools for carrying out a variety of tasks, and in particular to those which can usefully be manipulated by 5 one or two fingers.

- There are a large number of manual operations, traditionally carried out by gripping a conventional tool with all, or several, of the fingers of one hand, often in conjunction with the palm or other part of the hand. A 10 particular example of such operations is typically those associated with writing and drawing, in which a conventional pen, pencil, paint brush or the like must be gripped by at least two fingers and thumb, all of which must be manipulated in use to achieve the desired effects.
- 15 In the present invention, it has been recognised that if the necessity for gripping the tool with the fingers can be eliminated, then the function of manipulation can often adequately, or perhaps in some cases even better, be effected by a single finger.
- 20 This is of particular use when carrying out operations which require a great deal of precision and control, such as fine artwork, or applying make-up such as eye-liner, or applying hair-dressing treatments such as highlights. It is also of particular use where other fingers of the hand are not available for use, such as in the case of disablement, injury or 25 amputation. It is also of particular use where other fingers of the hand need to be kept free for other purposes, such as using a keyboard or keypad, turning pages or manipulating another tool.

It is an object of the present invention to provide a method and apparatus for attaching a tool to a finger in order that the tool can usefully be manipulated or operated by that finger.

- 5 It is a further object of the present invention to provide a method and apparatus for attaching a tool to a finger in order that the tool can usefull be manipulated by that finger and operated with another finger.

It is a further object to preferably provide such an apparatus as a tool  
10 carrier by which a variety of interchangeable finger tools can readily be attached to the finger in succession without removing the carrier from the finger.

It is a further object to alternatively provide such an apparatus integrally  
15 formed with a particular tool type which is non-interchangeable.

According to one aspect, the present invention provides a finger tool carrier for attaching to a finger comprising: attachment means for engaging the carrier with the distal end of a finger; engagement means  
20 for releasably engaging a finger tool with the carrier.

According to another aspect, the present invention provides a finger tool for attachment to a distal end of a finger, comprising: attachment means for engaging with the distal end of the finger; a tool element comprising  
25 any one of a writing implement, a drawing implement, an artist's implement, a cosmetics applicator, a hair-dressing implement, a cleaning implement or a craft tool.

Embodiments of the present invention will now be described by way of example with reference to the accompanying drawings in which:

Figure 1 shows a carrier according to one embodiment of the present invention in position on a forefinger, in which figure 1(a) shows 5 a right side view of the carrier, figure 1(b) shows a left side view of the carrier, and figure 1(c) shows a top view of the carrier with writing finger attached, and figure 1(d) shows a right side view of the carrier with writing finger tool attached;

Figure 2 shows a left side perspective view of a carrier according 10 to another embodiment of the present invention;

Figure 3 shows a right side perspective view of the carrier of figure 2;

Figure 4 shows detail of a release mechanism of the carrier of figures 2 and 3, in locked position, in which figure 4(a) is a right side 15 view, and figure 4(b) is an end view;

Figure 5 shows detail of a release mechanism of the carrier of figures 2 and 3 in open position, in which figure 5(a) is a right side view, and figure 5b is an end view;

Figure 6(a) is a perspective view showing detail of an attachment 20 mechanism for attaching the carrier to a finger, and figure 6(b) shows an adjustment mechanism therefor;

Figure 7 shows a carrier with writing tool, in which figure 7(a) is an end view of the carrier with tool attached, figure 7(b) is an underside plan view of the writing tool and figure 7(c) is a perspective view of the 25 carrier for receiving the tool;

Figure 8 shows a top plan view of the writing tool of figure 7 attached to the carrier;

Figures 9(a) and 9(b) are perspective and side views of an alternative carrier according to the present invention;

Figures 10(a), 10(b) and 10(c) are perspective views of an integrally formed carrier and tool;

Figures 11(a), 11(b), 11(c) and 11(d) are respectively left side, top, end and underside views of an integrally formed carrier and tool;

5 Figures 12(a) and 12(b) are respectively end view and detailed partial end view of an attachment mechanism of the carrier and tool of figure 11;

Figure 13 shows a perspective view of a finger tool comprising a light action scissor or shear;

10 Figure 14 shows a perspective view of a finger tool comprising a hair safety razor; and

Figure 15 shows a plan view of a finger tool for applying different colours of hair highlights.

15 With reference to the figures 1, there is shown a presently preferred embodiment of the present invention showing its general disposition with respect to a user's finger. Figure 1(a) shows a finger tool carrier 1 attached to a finger 2 in the preferred position around the distal phalanx  
3. For the purposes of the present description, it is assumed that the  
20 finger shown is the left index finger of a left handed person, but it will be understood that the present invention can be applied in respect of any finger, both left and right handed, with appropriate modification throughout the specification.

25 Figure 1(a) reveals the left side of the finger 2 and finger tool carrier 1, which incorporates a sliding release mechanism 4 which, in the orientation shown, is readily operable by the adjacent thumb on that hand. On a right hand, the carrier 1 can be reversed.

Figure 1(b) shows the right side of the finger 2 and finger tool carrier 1, which comprises an elasticated web material 5. On the top of the finger tool carrier 1 is provided a carrier plate, or saddle 6, upon which can be mounted a finger tool 100 (figures 1(c) and 1(d)).

5

The finger tool 100 in figure 1 is a writing implement having a ball point 101 or fibre tip, but as will become apparent, a wide variety of finger tools can be used.

- 10 Referring now to figure 2, a specific attachment mechanism suitable for attachment of the finger tool carrier 1 to the finger 2 is described. The carrier plate 6 (fig. 1) is preferably formed in a stiff or semi-rigid plastics material and includes a channel portion 10 defined by a base plate 11 with re-entrant sides 12, 13 and 14. A further, inner channel 15, also having re-entrant sides 16, 17 may also be provided, particularly when the carrier plate 6 has a degree of resilience.

- Moulded in the same piece of plastics material is a housing 20 for receiving a sliding lock plate (not shown in figure 2). The housing 20 20 comprises a pair of side members 21, 22 each of which includes a rebate portion 23 into which may be received an edge of the sliding lock plate 24 (figure 3).

- The lower portion 25 of the housing 20 provides an anchorage for a pair 25 of straps 30, 31 which are preferably elasticated and extend from the lower portion 25 to a rigid bar 32. The bar 32 is engageable with a receiving hook 33 formed in the edge of the carrier plate 6.

Referring now to figure 3, the sliding lock plate 24 resides between the housing side members 21, 22 and travels up and down within the rebates 23 (figure 2). At the top edge 35 of the sliding lock plate (24) is a series of teeth 38 which are adapted to engage with a finger tool 100 (figure 1)

5 engaged in the channel 10 as will be described hereinafter. The sliding lock plate 24 may be held in either its up or down position simply by friction fit within the housing 20 or, if necessary, may include a locking pin 36 which can be slid laterally across the locking plate from an unlocked position to a locked position (as shown in figure 3) in which it

10 engages with a groove 37 in the side member 21 when the sliding lock plate 24 is in the up position.

In figure 4, the function of a sliding lock plate 24 is illustrated by showing it in the up position (figures 4(a), 4(b)) and in the down position

15 (figures 5(a), 5(b)). In the up position, the teeth 38 project upwards beyond the top of channel side walls 13, 14 (figure 2), while in the down position, the teeth 38 recede below the level of the top of channel side walls 13, 14.

20 The sliding lock plate 24 may be biased to an up position by an appropriate spring mechanism, not shown.

With reference to figures 6(a) and 6(b), details of an adjustment mechanism for varying the length of the straps 30, 31 are shown. Each

25 flexible strap 30, 31 passes through a corresponding aperture 40, 41 in the rigid bar 32 and is provided with a ribbed or barbed surface 42 (figure 6b) which engages with an edge of the bar in known manner.

Referring now to figure 7, figure 7(a) shows an end cross-sectional view of a finger tool 100 installed into the channel 10. In the preferred embodiment, the finger tool 100 (figure 7(b)) provides a row of teeth 102, 103 on either longitudinal edge on the underside of the tool 100.

5 Thus, the tool can be slid into the channel 10 from either end and either way round and will still offer a series of teeth for interlocking with the teeth 38 of the sliding locking member 24.

The freedom of longitudinal movement of the tool 100 within the  
10 channel 10 when the sliding lock plate 24 is in the down position ensures  
that the tool can be slid to a convenient longitudinal position to the user,  
and then locked into place by the interlocking of the teeth 38 with either  
the row 102 or 103 of teeth.

15 Figure 7(c) shows a further arrangement in which the straps 30, 31 are replaced by an elasticated web or net 39, which facilitates ventilation of the finger to avoid excessive sweating. As another expedient for improving comfort, a backing material for inside surfaces of the finger tool carrier which would otherwise come into contact with the user's  
20 finger could be provided. The backing material could be any suitable padding or absorbent material for preventing chafing or for wicking away moisture and improving air circulation.

Figure 7(c) also illustrates that channel 15 can be duplicated to provide a  
25 series of parallel longitudinal channels along the main channel 10.

Figure 8 shows a plan view illustrating the finger tool 100 in position on the finger tool carrier 1. The finger tool may comprise any one of a series of possible instruments. For example, the tool 100 may be a

writing implement such as a pencil, propelling pencil, ball point pen, fibre tip pen or highlighter. The tool 100 may be a drawing implement, or generally an artist's implement, such as a paint brush or fibre tip pen. Particularly advantageously, the tool 100 may comprise one of a series 5 of cosmetics applicators for applying facial cosmetics such as eye-liner, mascara and the like or for applying hair cosmetics such as highlights or conditioning treatments. The tool may also provide precision cleaning implements, or other precision equipment such as that used by dentists and others. Further details of possible tools and their applications are 10 discussed later.

With reference now to figure 9, an alternative, simpler, form of finger 15 tool carrier 45 is shown. This comprises an open framework 46 formed of rubberised or resilient plastics material to allow a degree of flexibility when attached to the finger, but offering sufficient stiffness that a finger tool can be slidably engaged with grooves 47, 48 having a re-entrant profile and held firmly to the finger. An angled member 44 of the framework 46 allows for at least partial flexing of the finger when the carrier 45 is attached.

20

With reference to figure 10, a further embodiment is described. In this arrangement, the tool is integrally formed with the carrier so that the tool is not separable from the means for attaching the tool to the finger. Such arrangements are ideal for disposable tools such as pens and 25 pencils. The finger tool 50 of figure 10(a) comprises a framework portion 51 which may be similar to that described in connection with figure 9. An elongate shaft 52 carries the pen, or other tool, terminating in nib 53. In the arrangement shown in figure 10(b), the finger tool 55 comprises a carrier portion which may be formed of a suitable

elasticated web material 56, and a plastics material upper shell 57, which terminates in a nib 58 of, for example, of a felt tipped pen. A separable cap 59 may be provided for the nib 58. The cap 59 could include a rubberised end for use as a computer touchscreen activator.

5

With reference to figure 11, there is shown a further arrangement for an integrally formed finger tool 60. A body portion 61 houses an ink reservoir for a pen having nib 62. A cap 63 can be click fitted over the nib 62 (as shown in figure 11(b)) or over the rear end 64 of the body portion (as shown in figure 11(a)). The finger tool 60 includes a pair of resilient straps 65, 66 — best viewed in figures 11(c) and 11(d) — which are pre-formed to jointly define a loop to encircling a user's finger. An outer strap 66 overlaps the inner strap 65 in an overlap portion 67. Each of the straps 65, 66 preferably includes a number of parallel, equally spaced ribs 68, 69 which co-operate with ribs on the other strap in the overlap portion 67 in order to maintain the straps in generally fixed relation to one another.

In use, the user places a finger into the loop described by the straps 65, 66 which are sufficiently stiff to maintain a degree of pressure on the finger. This inner strap 65, trapped between the finger and outer strap 66 tends to engage at least some of its ribs 68 with corresponding ribs 69 of the outer strap 66, thereby maintaining the finger tool in place over the finger.

25

With further reference to figure 12, the straps 65, 66 may be provided with "click-fit" fastenings 70 having a male connector 71 on one strap 65 and a corresponding female connector 72 on the other strap 66, which can be removably fastened together in the overlap portion 67.

It will be understood that a large number of other strap mechanisms or other adjustable means for attaching the finger tool to the finger could be used. For example, Velcro fastenings could be used in place of  
5 fastenings 70.

With reference to figure 13, a finger tool 80 comprising a set of light action scissors or shears 81 is shown. In use, the carrier plate of the finger tool carrier 1 is rotated slightly on the finger 2 toward the  
10 opposing thumb 7. The upper face 82 of the tool 80 includes an actuating button 83 to operate the shears 81 which can be operated with the thumb 7. The finger tool shears 80 are of particular use in, for example, craft work and hair dressing or any other application in which a light shearing action is required.

15

Similarly, with reference to figure 14, a safety razor 85 with varied styles or shapes of guard is usable for hair dressing applications. The razor 85 is attached to the finger tool carrier 1 as previously described. The razor 85 can be drawn towards the body over hair 86 for thinning or  
20 finishing of hair work in hair dressing.

With reference to figure 15, a plan view of a multi-coloured hair light dispensing tool 90 is shown. In similar manner to that described for figure 13, this tool can be operated by a thumb pressing on the upper  
25 surface 91 thereof. Four dispensing nibs 92, 93, 94 and 95 are fed with respective coloured highlight material from reservoirs 96, 97, 98 and 99 which have transparent covers. Dispensing from each nib is effected by pressure on the respective reservoir on an appropriate part of the upper surface 91. Caps 105 may be provided for each nib.

Although a four colour, four reservoir model is shown, it will be understood that two, or another number of reservoirs may be provided. Adjacent colours on the four reservoir model, dispensing through 5 adjacent nibs could be provided as co-ordinating colours to be dispensed simultaneously to provide a streaking effect.

It will also be understood that each nib is fully accessible since the tool 90 is reversible on the finger tool carrier 1.

10

The tools described in connection with figures 13, 14 and 15 thus provide for manipulation of the tool by a single finger, combined with operability or actuation of the tool also by a single, usually adjacent, finger or thumb.

11

## CLAIMS

1. A finger tool carrier for attaching to a finger comprising:  
attachment means for engaging the carrier with the distal end of a  
5 finger;  
engagement means for releasably engaging a finger tool with the  
carrier.
2. A finger tool carrier according to claim 1 in which the attachment  
10 means comprises an adjustable strap.
3. A finger tool according to claim 1 or claim 2 in which the engagement  
means comprises a channel enabling sliding engagement of a  
finger tool therein.  
15
4. A finger tool according to claim 3 in which the engagement  
means includes a locking mechanism for locking the finger tool in one of  
a plurality of longitudinal positions along the channel.
- 20 5. A finger tool according to claim 4 in which the channel is adapted  
receive a finger tool from either end thereof.
6. A finger tool carrier according to claim 3 or claim 4 in which the  
lock means comprises a lock member in sliding engagement with a  
25 housing in the carrier, the lock member being moveable between a first  
position in which a finger tool may be free running within the channel  
and a second position in which the finger tool is locked into one  
longitudinal position within the channel.

7. A finger tool carrier according to claim 6 in which the lock member includes a plurality of teeth for engagement with a corresponding portion of a finger tool.
- 5 8. A finger tool carrier according to claim 2 in which the attachment means comprises an elasticated strap portion, adjustable in length.
9. A finger tool carrier according to claim 2 in which the attachment means includes a pair of resilient members each extending from a body portion of the carrier to jointly define a loop for encircling a finger, the distal end of each resilient member having means for co-operatively engaging with the other resilient member.
10. A finger tool carrier according to any preceding claim, further including a tool adapted for being received into said engagement means.
11. A finger tool according to claim 7 further including a tool adapted for being received into said engagement means, said tool including a plurality of teeth for engaging with the plurality of teeth on said lock member.
12. A finger tool and carrier according to claim 10 in which said tool comprises any one of a writing implement, a drawing implement, an artist's implement, a cosmetics applicator, a hair-dressing implement, a cleaning implement or a craft tool.
13. A finger tool for attachment to a distal end of a finger, comprising:  
attachment means for engaging with the distal end of the finger;

a tool element comprising any one of a writing implement, a drawing implement, an artist's implement, a cosmetics applicator, a hair-dressing implement, a cleaning implement or a craft tool.

5 14. A finger tool according to claim 13 in which the attachment means comprises an adjustable strap.

10 15. A finger tool according to claim 13 in which the attachment means includes a pair of resilient members each extending from a body portion of the tool to jointly define a loop for encircling a finger, the distal end of each resilient member having means for co-operatively engaging with the other resilient member.

15 16. A finger tool adapted for attachment to a finger tool carrier as defined in any one of claims 1 to 9.

17. A finger tool carrier, finger tool, or combined carrier and tool substantially as described herein with reference to the accompanying drawings.



The  
Patent  
Office  
IS

Application No: GB 9823242.4  
Claims searched: 1-17

Examiner: Peter Egerton  
Date of search: 7 December 1998

**Patents Act 1977**  
**Search Report under Section 17**

**Databases searched:**

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.P): B6P (PAGF)

Int Cl (Ed.6): A46B 5/04; B26B 27/00; B43K 23/004, 23/008, 23/012

Other: Online: WPI

**Documents considered to be relevant:**

Category	Identity of document and relevant passage	Relevant to claims
X	GB 1253963 (MACDONALD) see Fig 1 and page 1 lines 69-86 and page 2 lines 10-30	1-3,8, 10,12,13
X	GB 1253519 (VICTOR PEN) see Fig 1 and page 1 line 83 - page 2 line 9	1,3,10,12, 13
X	US 4738556 (BROWN) see Fig 2 and column 2 lines 7-43	1,2,10, 12-14
X	US 4602650 (PIPKIN) see Fig 4 and column 3 lines 21-62	1-3, 10-14,16
X	US 4213472 (L'OREAL) see Fig 4 and column 3 line 41- column 4 line 40	1,3,10,12, 13,16
X	US 4177698 (GRENEKER) see Fig 6 and column 3 lines 18-32	1,12,13
X	US 4162553 (BRUNO) see Fig 1 and column 2 lines 4-33	13,14,
X	US 3947132 (FOX) see Fig 4 and column 3 lines 58-68	1,10,12,13

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.



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Category	Identity of document and relevant passage		Relevant to claims
X	US 3887286	(BUCEY) see Fig 2 and column 3 lines 56-60	1,10,12, 13
X	US 3798698	(CONKLIN) see Fig 3 and column 1 line 61 -column 4 line 21	13,14,16

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